

TABLE 12.—ASSETS, AT THE BEGINNING OF THE YEAR, RELATED TO EXPENDITURES DURING THE YEAR, FOR THE OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE PROGRAM, BY TRUST FUND, CALENDAR YEARS 1960-76

Calendar year	Ratio of assets, at beginning of year, to expenditures during year		
	Old-age and survivors in- surance and disability insurance trust funds, combined	Old-age and survivors insurance trust fund	Disability insurance trust fund
<b>Past experience:</b>			
1960.....	1.86	1.80	3.04
1961.....	1.69	1.63	2.39
1962.....	1.46	1.41	2.06
1963.....	1.28	1.23	1.83
1964.....	1.22	1.18	1.59
1965.....	1.10	1.09	1.21
1966.....	.95	.96	.82
1967.....	.99	1.01	.83
1968.....	1.01	1.03	.83
1969.....	1.03	1.02	1.11
1970.....	1.03	1.01	1.26
1971.....	.99	.94	1.40
<b>Estimated future experience:</b>			
1972.....	.99	.92	1.53
1973.....	1.06	.98	1.71
1974.....	1.25	1.17	1.92
1975.....	1.48	1.40	2.14
1976.....	1.72	1.63	2.36

### ACTUARIAL ANALYSIS OF BENEFIT DISBURSEMENTS FROM THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE TRUST FUND WITH RESPECT TO DISABLED BENEFICIARIES

(Specifically required by Sec. 201(c) of the Social Security Act)

Effective January 1957, monthly benefits have been payable from the old-age and survivors insurance trust fund to disabled adult children aged 18 and over—sons and daughters of retired and deceased workers—with respect to disabilities that have continued since childhood. Effective February 1968, reduced monthly benefits have been payable from this trust fund to disabled widows and widowers beginning at age 50.

On December 31, 1971, about 355,000 persons were receiving monthly benefits from the old-age and survivors insurance trust fund with respect to disability. In addition to disabled beneficiaries, this total includes 28,000 mothers. These mothers—wives under age 65 of retired-worker beneficiaries and widows of deceased insured workers—met all other qualifying requirements and were receiving benefits solely because they had at least one disabled-child beneficiary in their care. Benefits paid from this trust fund to this class of beneficiaries totaled \$381 million in calendar year 1971, or 0.090 percent of taxable earnings for that year. Similar figures are presented in table 13 to show the past experience in each of the calendar years 1957-71.

Table 13 also shows the expected future experience in calendar years 1972-76. Total benefit payments from the old-age and survivors insurance trust fund with respect to disabled beneficiaries will increase from \$406 million in calendar year 1972 to \$498 million in 1976.

In calendar year 1971, benefit payments (including expenditures for vocational rehabilitation services) with respect to disabled persons from the old-age and survivors insurance trust fund and from the

disability insurance trust fund (including payments from the latter fund to all dependents of disabled-worker beneficiaries) totaled \$4,163 million, of which \$381 million, or 9.1 percent, represented payments from the old-age and survivors insurance trust fund. Similar figures for all of the calendar years 1957-76 are presented in table 14.

TABLE 13.—BENEFITS PAYABLE FROM THE OLD-AGE AND SURVIVORS INSURANCE TRUST FUND WITH RESPECT TO DISABLED BENEFICIARIES, CALENDAR YEARS 1957-76

[Beneficiaries in thousands; benefit payments in millions]

Calendar year	Disabled beneficiaries, end of year			Amount of benefit payments <sup>1</sup>		
	Total	Children <sup>2</sup>	Widows and widowers	Total	Children <sup>2</sup>	Widows and widowers
<b>Past experience:</b>						
1957	34	34		\$7	\$7	
1958	59	59		23	23	
1959	94	94		41	41	
1960	117	117		59	59	
1961	138	138		74	74	
1962	163	163		89	89	
1963	183	183		101	101	
1964	200	200		113	113	
1965	214	214		134	134	
1966	228	228		147	147	
1967	243	243		163	163	
1968	278	256	22	213	198	\$15
1969	309	270	39	254	214	40
1970	333	284	49	314	260	54
1971	355	298	57	381	307	74
<b>Estimated future experience:</b>						
1972	375	312	63	406	326	80
1973	394	326	68	431	345	86
1974	412	339	73	455	365	90
1975	430	353	77	477	383	94
1976	447	367	80	498	401	97

<sup>1</sup> Beginning in 1966, includes payments for vocational rehabilitation services.

<sup>2</sup> Reflects effect of including a relatively small number (about 28,000 at the end of 1971) of mothers—wives under age 65 of retired-worker beneficiaries and widows of deceased insured workers—who met all other qualifying requirements and were receiving benefits solely because they had at least one disabled-child beneficiary in their care.

## REPORT OF THE 1971 ADVISORY COUNCIL ON SOCIAL SECURITY

Pursuant to section 706 of the Social Security Act, an Advisory Council on Social Security was appointed by the Secretary of Health, Education, and Welfare in May 1969. The Council submitted its report on April 5, 1971. Among its findings and recommendations are those concerning changes in the benefit provisions of the old-age, survivors, and disability insurance programs. Some of these recommendations would require additional financing, but do not affect the financing methods or the operation of the trust funds, and are not referred to further. The Council has made certain other recommendations which do affect directly the financing methods, the actuarial methodology, and the adequacy of the trust funds. As to these, the Trustees have the responsibility of a careful evaluation, and the transmittal of the Trustees' views as a part of this, or subsequent, reports.

The Council has organized its findings in the financing area under twelve headings. Two of these (nos. 9 and 11) concern only the Medicare portion, and will be treated in the Reports of the Board of Trustees of the Hospital Insurance and Supplementary Medical Insurance.

TABLE 14.—BENEFIT PAYMENTS UNDER THE OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE PROGRAM WITH RESPECT TO DISABLED BENEFICIARIES, BY TRUST FUND, CALENDAR YEARS 1957-76

[In millions]

Calendar year	Benefit payments <sup>1</sup> from—			
	Total <sup>1</sup>	Disability insurance trust fund <sup>2</sup>	Old-age and survivors insurance trust fund	
Amount <sup>3</sup>			As a percentage of total benefit payments with respect to disabled beneficiaries	
<b>Past experience:</b>				
1957.....	\$64	\$57	\$7	11.1
1958.....	272	249	23	8.5
1959.....	498	457	41	8.2
1960.....	627	568	59	9.4
1961.....	961	887	74	7.7
1962.....	1,194	1,105	89	7.4
1963.....	1,311	1,210	101	7.7
1964.....	1,422	1,309	113	8.0
1965.....	1,707	1,573	134	7.9
1966.....	1,932	1,784	147	7.6
1967.....	2,113	1,950	163	7.7
1968.....	2,524	2,311	213	8.5
1969.....	2,811	2,557	254	9.0
1970.....	3,400	3,085	314	9.2
1971.....	4,163	3,783	381	9.1
<b>Estimated future experience:</b>				
1972.....	4,512	4,106	406	9.0
1973.....	4,837	4,406	431	8.9
1974.....	5,139	4,684	455	8.9
1975.....	5,421	4,944	477	8.8
1976.....	5,693	5,195	498	8.7

<sup>1</sup> Beginning in 1966, includes payments for vocational rehabilitation services.<sup>2</sup> Benefit payments to disabled workers and their dependents.<sup>3</sup> Benefit payments to disabled children aged 18 and over, to certain mothers (see footnote 2, table 13), and, beginning in 1968, to disabled widows and widowers.

### C. FINANCING

#### *Actuarial Soundness of the Program*

1. *Current Status*—Adequate provision has been made in the law to meet all the costs of the cash benefits program both in the short run and over the long-range future; the cash benefits program is actuarially sound.

The Board of Trustees concurs in the above statement of the Advisory Council. Actuarial soundness of the current program is demonstrated in the later section of this Report entitled "Actuarial Status of the Trust Funds".

#### *Management and Investment of the Trust Funds*

2. *Investment Policy*—The Managing Trustee of the social security trust funds should adopt a policy of investing in special obligations with maturity dates equal to the maximum maturity date of Treasury notes (at present 7 years) rather than maturity dates of 15 years from the date of purchase.

The Board of Trustees concurs in this recommendation of the Advisory Council, and the Managing Trustee will adopt such a policy.

3. *Interest Rate Formula*—The interest rate on special obligations issued to the trust funds should be equal to the average market yield on all marketable Treasury notes that are not due or callable until 4 or more years from the time the special obligations are issued.

The Board of Trustees has no position as to this recommendation at the present time, pending further study as to whether the interest-rate on special obligations will be higher or lower under the Advisory Council's recommendation than under current law.

4. *Securities Issued by Federally Sponsored Agencies*—*The Council believes that there is adequate statutory authority for investment of trust fund money in securities issued by federally sponsored agencies. The Council recommends that the Managing Trustee establish a policy of purchasing a portion of new obligations issued by such agencies as investments for the trust funds.*

The Board of Trustees is still investigating the implications of this recommendation, and has no position at the present time.

5. *Boards of Trustees*—*The Council recommends that two non-government members, to be appointed by the President subject to confirmation by the Senate, be added to the Boards of Trustees of the social security trust funds.*

The Board of Trustees supports this recommendation of the Advisory Council, and recommends to Congress that the law be changed to add two non-government members.

6. *The Trust Funds and the Unified Budget*—*Even though the operations of the social security trust funds and other Federal trust fund programs are combined with the general operations of the Federal Government in the unified Federal budget, policy decisions affecting the social security program should be based on the objectives of the program rather than on any effect that such decisions might have on the Federal budget. The operations of the social security and other Federal trust funds should continue to be identified as such and separated from the general operations of the Government.*

The Board of Trustees agrees that the Social Security system should be financed in accordance with the financial principles of the program, and that the contribution rate should not be set out of considerations of broad fiscal policy or because of the impact of the financing provisions on the unified budget balance.

#### *Actuarial Assumptions and Methodology*

7. *Earnings Assumptions*—*The Council recommends that the actuarial cost estimates for the cash benefits program be based—as the estimates for the hospital insurance program now are—on the assumptions that earnings levels will rise, that the contribution and benefit base will be increased as earnings levels rise, and that benefit payments will be increased as prices rise.*

The Board of Trustees concurs in this recommendation, provided that a safety margin is introduced into the estimates to protect the system against the sensitivity of the estimates to the economic variables and against the many ways in which the actuarial assumptions may prove to understate the long-range costs. The Trustees consider dynamic assumptions as recommended by the Council fully appropriate for a system including the so-called "automatic provisions" which are a part of H.R. 1. Although the Council apparently meant its recommendation to apply to the present program, the Trustees have not undertaken to establish a position on whether the change to dynamic assumptions would be appropriate for the present system, since legislation which would introduce the automatic provisions has

passed both Houses of Congress and presumably will soon be a part of the Social Security Act. A later section of this report includes two actuarial estimates, one based on the Council's recommended methodology and the other on the traditional methodology.

8. *Single Best Estimate*—*Contribution rates should be based on a single, best estimate derived from a single set of assumptions that reflect likely future trends in the factors that affect income and outgo of the program, rather than on an average of a low-cost and a high-cost estimate, as has been the case in the past; and there should be a series of estimates which show the extent to which the best estimate might vary if experience with respect to any of the major factors were to differ from the assumptions.*

The Board of Trustees concurs in this recommendation of the Advisory Council, as long as the single estimate is understood to include the safety margin referred to under recommendation 7. Estimates in this report are so presented. A series of illustrations to show variation by the major assumptions appears in the appendix, but these illustrations are so far confined to variation in the assumptions concerning price and earnings increases. The principle of sensitivity testing will be further developed in the future.

10. *Current Cost Financing*—*The financing of the program should be on a current-cost basis, with the trust funds maintained at a level approximately equal to one year's expenditures.*

The Board of Trustees concurs with this recommendation of the Advisory Council. It notes that the Council specifically recommends that the law be changed to require the Board of Trustees to report immediately to the Congress whenever it is expected that the size of any of the trust funds will fall below three-quarters of the amount of the following year's estimated expenditures, or will reach more than one and one-quarter times such expenditures. The Board of Trustees supports the Council's specific legislative proposal.

12. *Contribution Rates*—*The Council believes that the contribution rate schedule for the next 10 years should be designed to follow closely the principle of current-cost financing, described in Part IV. Contribution rates for the cash benefits program after the next 10 years would be shown in two steps, each based on average rates for an extended period of several decades.*

The Board of Trustees endorses this recommendation in broad principle. The Board believes near-term contribution rates should be set in accordance with the principle of current-cost financing (see recommendation 10). At the same time the Board of Trustees agrees that any contribution rates scheduled beyond the near term can be based on average rates over an extended period, rather than on current-cost financing principles.

## ACTUARIAL STATUS OF THE TRUST FUNDS

### *Factors Affecting Long-Range Costs*

The long-range cost of the old-age, survivors, and disability insurance system will depend in the future, as it has in the past, on demographic factors, on economic factors, and on the action of Congress with respect to changes in benefits, in the taxable earnings base, and in the classes of persons covered.

Table 15 traces the history of the expenditures from the old-age, survivors, and disability insurance trust funds as a percentage of

taxable payroll. Several benefit increases and extensions of coverage are reflected in the expenditures; and several changes in the taxable earnings base are reflected in taxable earnings, as are changes in the earnings level of covered workers. Comparison with table 1 will indicate when changes in the taxable earnings base have occurred, and will also indicate the relationship between (1) the expenditures as a percent of taxable payroll, and (2) the contribution rates paid by employer and employee.

Table 15 indicates an upward trend, except for the period 1962 through 1969, during which expenditures as a percent of taxable payroll held relatively constant.

Demographic factors were responsible for part of the increase shown by table 15. The ratio of persons over 65 (potential beneficiaries) to those 20-64 (potential workers) increased over most of the 30-year period. The relatively large number of children born during the period beginning in about 1945 are now beginning to swell the ranks of worker-contributors, and will slow the increase in this important ratio until about 1990, when the ratio is expected to start a gradual descent. After about 2010, the ratio is expected to rise rather sharply as those born shortly after World War II reach age 65.

TABLE 15.—EXPENDITURES OF THE OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE TRUST FUNDS AS PERCENT OF TAXABLE PAYROLL, FOR SELECTED YEARS 1940-71

Calendar year—	Expenditures <sup>1</sup> as a percentage <sup>2</sup> of taxable <sup>3</sup> payroll		
	OASI	DI	OASDI
1940.....	0.19	( <sup>4</sup> )	0.19
1945.....	.48	( <sup>4</sup> )	.48
1950.....	1.17	( <sup>4</sup> )	1.17
1955.....	3.34	( <sup>4</sup> )	3.34
1960.....	5.59	0.30	5.89
1961.....	6.13	.47	6.60
1962.....	6.60	.56	7.16
1963.....	6.84	.59	7.43
1964.....	6.83	.62	7.45
1965.....	7.23	.70	7.93
1966.....	6.24	.64	6.88
1967.....	6.27	.65	6.92
1968.....	6.36	.67	7.03
1969.....	6.32	.69	7.01
1970.....	7.26	.80	8.06
1971.....	8.11	.95	9.06

<sup>1</sup> For 1940-54, percentages are based on the sum of payments for benefits and administrative expenses. Starting in 1955, transfers to the railroad retirement account and, starting in 1966, payments for vocational rehabilitation services, are included in expenditures. Beginning in 1966, expenditures are adjusted to exclude payments under section 228 of the Social Security Act to certain noninsured persons aged 72 and over with less than 3 quarters of coverage, costs of which are financed from the general fund of the Treasury.

<sup>2</sup> Percentage takes into account, for 1951 and later, (1) lower contribution rate payable by the self-employed compared with combined employee-employer rate, (2) employee contributions subject to refund, and (3) for 1966 and later, that only the employee contribution is payable on tips taxable as wages.

<sup>3</sup> For 1968-71, percentages are preliminary and subject to revision when a complete tabulation of taxable earnings is available.

<sup>4</sup> The disability insurance program started operating in 1957.

The rising level of earnings experienced in the United States almost continuously since 1940 is a factor tending to increase the taxable payroll, and hence to hold down the expenditures as a percent of taxable payroll. The several increases in the taxable earnings base have had a similar effect.

Substantial general benefit increases are responsible for the marked rise in the table 15 result in 1970 and 1971, and in certain other years. Other increases come from the introduction of disability benefits in 1957, and many minor benefit liberalizations which have taken place over the years. Extension of coverage to new groups of workers has had an upward effect on both trust fund expenditure and taxable earnings, and in most cases has not materially affected the table 15 result.

#### *Long-Range Cost Estimates*

Long-range cost estimates for the old-age, survivors, and disability insurance system are presented in this report under two rather different sets of assumptions with respect to the future levels of the benefits provided.

#### *Level-Benefit Level-Earnings Assumption*

The first set of estimates is based on the level benefit level earnings assumption employed in the past. The system is evaluated as if the statute were static, with the benefit table and other provisions held constant into the future. Similarly, the level of earnings of covered workers and the taxable wage base are held constant. The resulting cost estimates, when expressed as a percentage of taxable payroll, are essentially those that would be obtained if Congress acted in such a fashion that the benefit table were to increase at a rate somewhat slower than earnings, but (under most reasonable assumptions as to the relationship between price and earnings changes) faster than prices. If the benefit table does increase at such a rate, the average benefit per beneficiary will increase faster than earnings, because of the effect of earnings increases on the level of benefits for beneficiaries coming on the rolls in the future.

This set of estimates is appropriate for a static law, like the current law, which has no automatic features. These estimates may be considered to be "conservative", in that they will overstate the long-range costs if Congress does not in fact adjust the benefit table upward as described above. Contribution rates set in accordance with these level-benefit level-earnings estimates make it possible for Congress to increase the benefit table at a rate faster than prices without increasing the contribution rates. In this sense, financing in accordance with these estimates may be considered to encourage future benefit table increases beyond those necessary to keep up with the cost of living.

Table 16 shows "current costs" for selected years over the next 75 years, expressed as a percent of taxable payroll. Table 16 is presented on a single best estimate basis, as was recommended by the 1971 Advisory Council. Details of the actuarial assumptions employed will be found in the appendix. It should be emphasized that table 16 is based on the level-benefit level-earnings assumption. The benefit table and taxable wage base are assumed to remain as in current law, and earnings of covered workers are assumed to remain at the 1971 level.

TABLE 16.—ESTIMATED "CURRENT COST"<sup>1</sup> OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE SYSTEM AS PERCENT OF TAXABLE PAYROLL<sup>2</sup>, 1971 LEVEL-EARNINGS ASSUMPTION, FOR SELECTED YEARS, 1972-2045

[In percent]

	Old-age and survivors insurance	Disability insurance	Total
Calendar year:			
1972.....	7.57	0.92	8.49
1975.....	7.74	.99	8.73
1980.....	8.27	1.09	9.36
1985.....	8.86	1.16	10.02
1990.....	9.29	1.19	10.48
1995.....	9.31	1.22	10.53
2000.....	9.02	1.30	10.32
2005.....	8.85	1.39	10.24
2010.....	9.14	1.46	10.60
2015.....	9.83	1.48	11.31
2020.....	10.67	1.47	12.14
2025.....	11.31	1.43	12.74
2030.....	11.50	1.41	12.91
2035.....	11.41	1.45	12.86
2040.....	11.37	1.45	12.82
2045.....	11.44	1.44	12.88
Level-cost <sup>3</sup> .....	8.98	1.18	10.16

<sup>1</sup> Represents the cost as percent of taxable payroll of all expenditures in the year, including amounts needed to maintain the funds at about 1 year's expenditures.

<sup>2</sup> Payroll is adjusted to take into account the lower contribution rate on self-employment income, on tips, and on multiple-employer "excess wages" as compared with the combined employer-employee rate.

<sup>3</sup> This is the level contribution rate at an interest of 5.25 percent needed to finance all future expenditures for the 75-year period 1972-2046, and includes adjustments to take into account the funds on hand at the beginning of the period, and the reimbursement for additional cost of noncontributory credits for military service.

Table 17 compares the level equivalent over the 75-year period, 1972-2046, of the annual costs illustrated in table 16, after adjustment for the effect of the funds on hand, with the level equivalent of the tax rates scheduled in current law.

It should be observed that the system is in close actuarial balance in accordance with the level-benefit level-earnings assumption, showing a positive actuarial balance of +0.13 percent of taxable payroll for OASI, a negative actuarial balance of -0.08 percent of taxable payroll for DI, and a positive actuarial balance of +0.05 percent of taxable payroll for the combined OASDI system.

The Trustees believe that, although for several years the "current cost" of the disability insurance program will be lower than the current allocation of 1.10 percent of taxable payroll, the Congress should, at some time in the future, increase this allocation by 0.10 percent of taxable payroll so as to bring both parts of the old-age, survivors, and disability insurance system into closer actuarial balance.

TABLE 17.—ESTIMATED ACTUARIAL BALANCE OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE SYSTEM AS PERCENT OF TAXABLE PAYROLL<sup>1</sup>, 1971 LEVEL-EARNINGS ASSUMPTION

[In percent]

Item	OASI	DI	Total
Level-cost of system.....	8.98	1.18	10.16
Level-equivalent of present tax schedule.....	9.11	1.10	10.21
Actuarial balance.....	+ .13	-.08	+ .05

<sup>1</sup> Payroll is adjusted to take into account the lower contribution rate on self-employment income, on tips, and on multiple employer "excess wages" as compared with the combined employer-employee rate.

### *Dynamic Assumptions*

The 1971 Advisory Council recommended that the level-benefit level-earnings assumption be replaced by dynamic assumptions as to benefit table increases and as to the rate of increase in taxable earnings. Estimates based on such dynamic assumptions basically assume (1) that provisions automatically adjusting the benefit table in accordance with the Consumer Price Index, and automatically adjusting the taxable earnings base in accordance with the increase in covered earnings per worker are (or can be imputed to be) a part of the structure of the system, and (2) if Congress were to grant larger benefit table increases, to liberalize the benefits in any other sense, or to hold down the taxable earnings base, it would simultaneously provide additional financing.

Cost estimates on such dynamic assumptions provide the financing needed to increase the benefit table in step with the Consumer Price Index, but do not provide financing for benefit table increases in excess of the increase in prices. They do not, in fact, provide for benefit increases as large as those financed by the level-benefit level-earnings assumption. Cost estimates beyond the early years are therefore lower on dynamic assumptions than on the level-benefit level-earnings assumption. Cost estimates based on dynamic assumptions are therefore less conservative, in the traditional sense. Financing in accordance with dynamic estimates may also be considered less likely to lead to benefit table increases beyond that of increases in prices, in that no such financing is prearranged.

The Trustees consider dynamic assumptions appropriate for a law that provides for automatic adjustments in the benefit table and the taxable wage base, and provided that a margin of safety is introduced. Although automatic features are not a part of current law, they are a part of H.R. 1 passed by the House, and somewhat similar provisions were passed by both houses of the 91st Congress.

Table 18 shows the current cost of the OASDI system (including amounts needed to maintain funds equal to one year's expenditures) for selected years over the next 75 years, expressed as percent of taxable payroll, in accordance with the Advisory Council's recommended actuarial methodology.

The results in table 18 are based on the same actuarial assumptions as those in table 16, with the following notable exceptions:

(a) The benefit table is not assumed to remain fixed, but instead is assumed to be adjusted annually to reflect a  $2\frac{3}{4}$  percent increase (the first such increase in 1972) in accordance with the assumption that the Consumer Price Index increases by that amount annually.

(b) Average earnings per covered worker are assumed to start at the estimated 1971 level, and to increase at 5 percent annually thereafter. The taxable wage base (\$9,000 in 1972) and the exempt amount under the earnings test (\$1,680 in 1972) are both assumed to increase at 5 percent annually after 1972.

TABLE 18.—ESTIMATED CURRENT COST<sup>1</sup> OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE SYSTEM AS PERCENT OF TAXABLE PAYROLL<sup>2</sup> UNDER DYNAMIC ASSUMPTIONS<sup>3</sup>, FOR SELECTED YEARS, 1972-2045

[In percent]

Calendar year	Old-age and survivors insurance	Disability insurance	Total
1972	7.59	0.93	8.52
1975	7.45	.94	8.39
1980	7.34	.95	8.29
1985	7.43	.99	8.42
1990	7.45	.98	8.43
1995	7.16	1.00	8.16
2000	6.83	1.09	7.92
2005	6.77	1.21	7.98
2010	7.18	1.31	8.49
2015	7.85	1.34	9.19
2020	8.61	1.34	9.95
2025	9.20	1.31	10.51
2030	9.41	1.30	10.71
2035	9.41	1.35	10.76
2040	9.45	1.37	10.82
2045	9.61	1.37	10.98
Average cost <sup>4</sup>	8.05	1.18	9.23

<sup>1</sup> Represents the cost as percent of taxable payroll of all expenditures in the year, including amounts needed to maintain the funds at about 1 year's expenditures.

<sup>2</sup> Payroll is adjusted to take into account the lower contribution rate on self-employment income, on tips, and on multiple-employer "excess wages" as compared with the combined employer-employee rate.

<sup>3</sup> Under the dynamic assumptions, the average taxable earnings, the taxable earnings base, and the exempt amount in the earnings test are assumed to increase at a rate of 5 percent per year. It is also assumed that the benefit table will be subject to annual increases of 2¾ percent according to increases in CPI.

<sup>4</sup> Represents the arithmetic average of the "current cost" for the 75-year period 1972-2046.

The results in table 18 are sensitive to the two economic assumptions. Illustrations of the effect on these results of varying the earnings increase assumption and the CPI increase assumption will be found in the appendix. Because of this sensitivity, and as a provision against all the other ways in which the long-range estimates may prove to underestimate the costs, a specific contingency margin has been built into table 18. The amount of this margin is three-eighths of 1 percent each year from 1972 until the year 2010.

This contingency margin is such that, if all of the actuarial and economic assumptions were to work out exactly as estimated, a benefit table increase of 3½ percent annually up to the year 2010, instead of the 2¾ percent assumed, would be adequately financed.

The contingency margin is also of such a magnitude that, if all of the actuarial and economic assumptions were to work out exactly, and if contribution rates were to be set exactly in accordance with the calculation illustrated in table 18, an overfinancing of about 3 percent could theoretically be expected after eight years. Actuarial and economic assumptions will not work out exactly, contribution rates will not be set exactly in accordance with the calculation, and if overfinancing were to develop because of the contingency margin or for any other reason, the continuing annual review of the actuarial status would reveal any overfinancing as it developed. Adjustments would be made in accordance with the developing experience, so any theoretical overfinancing is not likely to accumulate.

Table 19 compares the average long-range cost of the OASDI system under dynamic assumptions with the average rate in the tax schedule in present law. Under this set of assumptions, the old-age, survivors, and disability insurance system is found to be substantially overfinanced, with a positive actuarial balance of +1.04 percent of taxable payroll. This overfinancing is due entirely to the old-age and survivors insurance program, which would be shown to have an actuarial surplus of +1.12 percent of taxable payroll, since the disability insurance program would be shown as having a negative actuarial balance of -0.08 percent of taxable payroll. This indicates again the need for a future increased allocation to the disability insurance trust fund.

TABLE 19—ESTIMATED ACTUARIAL BALANCE OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE SYSTEM AS PERCENT OF TAXABLE PAYROLL,<sup>1</sup> DYNAMIC ASSUMPTIONS<sup>2</sup>

[In percent]			
Item	OASI	DI	Total
Average cost of system.....	8.05	1.18	9.23
Average rate in present tax schedule.....	9.17	1.10	10.27
Actuarial balance.....	+1.12	-.08	+1.04

<sup>1</sup> Payroll is adjusted to take into account the lower contribution rates on self-employment income, on tips, and on multiple-employer "excess wages" as compared with the combined employer-employee rate.

<sup>2</sup> Under the dynamic assumptions, the average taxable earnings, the taxable earnings base, and the exempt amount in the earnings test are assumed to increase at a rate of 5 percent per year from 1971 on. It is also assumed that the benefit table will be subject to annual increases of 2¾ percent according to increases in CPI. In addition, a safety margin of ¼ of 1 percent per year is added for years up to 2010.

## CONCLUSION

The long-range actuarial cost estimates for the old-age, survivors, and disability insurance program prepared in accordance with the level-benefit level-earnings assumption employed in the past, indicate that the OASDI system as a whole is in close actuarial balance. The system has a small positive actuarial balance (0.05 percent of taxable payroll on a level-cost basis computed over 75 years) indicating that the system continues to be financed on an actuarially sound basis.

The long-range actuarial cost estimates made in accordance with dynamic assumptions as recommended by the Advisory Council are useful in illustrating the effect of the Advisory Council methodology, which is endorsed by the Trustees (subject to the introduction of an appropriate safety margin) for a system that includes the automatic principle. The central estimate, based on the assumptions that the Consumer Price Index will increase by 2¾ percent annually while earnings per worker and the taxable earnings base increase at 5 percent annually, indicates that the schedule in current law may overfinance the system by about 10 percent. The appendix shows the result of varying these important economic assumptions, to which these cost estimates are particularly sensitive.

The combined old-age and survivors and disability insurance trust funds at the end of 1971 (\$40.4 billion) are 99 percent of the estimated combined trust fund expenditures for 1972 (\$41.0 billion). The Advisory Council's guideline that the trust funds should be approximately equal to the following year's estimated expenditures is almost exactly

met under present law, though the ratio will fall somewhat if liberalizations affecting benefits in the calendar year 1972 should be enacted.

Over the short range, the old-age, survivors and disability insurance system under the present law is more than adequately financed. For calendar 1972, the contribution rate of 4.6 percent on each of employer and employee with respect to the first \$9,000 of earnings will result in a fund growth in excess of \$5 billion. The current cost principle of the Advisory Council would be more closely followed if the 1972 contribution rate were reduced. The Trustees recommend that the 1972 total contribution rate of 5.2 percent (4.6 percent for old-age, survivors, and disability insurance, 0.6 percent for hospital insurance) be reallocated to give a larger portion to hospital insurance, unless other changes in the benefits or the financing make such a reallocation inappropriate. Such a reallocation will improve the financing of both systems; yet will leave the combined contribution rates paid by employer and employee during 1972 unchanged.

The Board of Trustees, in viewing the system beyond the end of the current calendar year, recognizes that important legislation is pending, which would introduce the principle of automatic adjustment of both the benefit table and the taxable earnings base, and simultaneously make certain changes in benefits. The Board of Trustees recommends that contribution rates for any such new legislation be set in accordance with the current cost financing principle; and in accordance with dynamic assumptions as recommended by the Council, but with a contingency margin.



# APPENDIX

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## STATEMENT OF ASSUMPTIONS, METHODOLOGY, AND DETAILS OF LONG-RANGE COST ESTIMATES

(Prepared by the Office of the Actuary—Social Security Administration)

The basic assumptions used in the long-range estimates for the old-age, survivors, and disability insurance system are described in this appendix. Also given here are more detailed data in connection with the results of these estimates.

Section A of this appendix provides a description of the demographic aspects of the long-range cost estimates, while section B discusses the economic aspects. These terms are used in a general sense, since it is not entirely possible to fully separate the effect of these two aspects on the cost estimates. By "demographic aspects" we mean those elements dealing with the population and its characteristics. These include the number, age, sex, marital status, retirement, disability, mortality, fertility, employment, and coverage under the system. By "economic aspects" we mean those elements dealing with projected average benefits, and with projected increases in earnings and prices.

It should be observed that although the level-earnings cost estimates have been referred to as "static estimates" they are fully dynamic in all of their demographic aspects. As such, they are essentially identical to the "dynamic estimates" in these aspects. The difference between the two types of estimates is due to the assumptions used to project the economic aspects.

### A. DEMOGRAPHIC ASPECTS

This section of the appendix discusses the methods used to estimate the demographic elements of the OASDI cost projections and their effect on the cost estimates.

As recommended by the Advisory Council, separate high cost and low cost estimates are no longer presented, and the demographic elements of the cost estimate are based on a single demographic projection. Because of the time required to fully implement the intent of the Council's recommendation, this single best estimate of the demographic elements is still of an intermediate nature, having been determined as a blend between the high and low cost projections prepared for the 1971 Report. For the future it is intended that the underlying demographic assumptions will be reevaluated, and that they can then be expressed more independently and more exactly. Until then the cost estimates presented are in substantial conformance with the Advisory Council's recommendation as to a single best estimate, but full conformance has not quite been achieved.

#### (1) POPULATION

Projections were made of the United States population (including persons overseas covered by the old-age, survivors, and disability insurance program) for future quinquennial years, by 5-year age groups and by sex. The starting point was the population on July 1, 1965, as estimated by the Bureau of the Census from the 1960 Census and from births, deaths, and migration in 1960-65. This population estimate was increased to allow for probable under-enumeration in the 1960 Census and adjusted for differences in the geographical areas covered by the estimate of the Bureau of the Census and those covered by the old-age, survivors, and disability insurance system.

Two population projections were prepared and in both it is assumed that mortality rates will decline until the year 2000. In the high-cost projection, mortality rates for the year 2000 are, on the average, about 27 percent lower than

those experienced in 1959-61. The mortality is projected to decrease by about 40-55 percent at the younger ages, but with the rates at the older ages showing somewhat smaller improvements. The low-cost projection assumes exactly half of the improvement in mortality used in the high-cost projection.

In the low-cost projection, fertility rates were assumed to decrease slowly until reaching a level in 1985 roughly equivalent to about 83 percent of the average rates prevailing in the period 1960-65. The high-cost fertility rates decrease more rapidly and reach an ultimate rate in 2010 equivalent to about 68 percent of the 1960-65 experience. Both projections assume a small amount of net immigration.

The low-cost projection is based on high fertility and high mortality, while the high-cost projection assumes low fertility and low mortality. This makes the high-cost population relatively much older than the low-cost population, which is reasonable in view of the fact that benefits to aged persons account for more than 80 percent of the cost of the system. Complete details about the population projections are given in *Actuarial Study No. 62*, Social Security Administration.

#### (2) EMPLOYMENT

Assumptions as to the percentage of the population who have covered employment during a year were made for each age group by sex for each quinquennial year. The estimated average percentages for 1964-68 for males were projected to remain level except for the older ages where they were assumed to decrease for both the low-cost and high-cost assumptions (thus recognizing the possibility of higher retirement rates). An increase was assumed for females, except for the very old ages; these increases are higher in the middle ages and are a continuation of trends in the past.

The foregoing assumptions are consistent with the assumptions as to the average unemployment rate in the future. A depression lasting several years could substantially increase the cost, but it is believed that any periods of low employment would be relatively of short duration and would have virtually no long-range cost effect.

#### (3) INSURED POPULATION

The term "insured" is used as meaning fully insured, since the number of persons who are currently insured only is relatively small and can be disregarded for long-range cost analysis purposes. The percentages of insured persons by age and sex in various future years are estimated from recent experience and from the projected covered. It is evident that eventually almost all males in the country will be insured for old-age and survivor benefits; the ultimate percentage for aged males is estimated at 95 percent in the low-cost projection and 98 percent in the high-cost projection. For females there is much greater uncertainty; it is estimated that the corresponding proportions for aged females will eventually be 70 percent in the low-cost projection and 75 percent in the high-cost projection (the differential reflecting the range possible because of women moving in and out of the labor market and whether thereby they do or do not obtain insured status).

The estimated numbers of persons insured for disability benefits are lower than those insured for old-age and survivor benefits because of the more restrictive insured status provisions for disability benefits. These were also estimated on the basis of recent experience and the projected percentage of persons covered.

#### (4) OLD-AGE AND SURVIVORS INSURANCE BENEFICIARIES

Old-age beneficiaries were estimated from the aged insured population. The proportions, by age and sex, of the insured population that were receiving benefits at the beginning of 1971 were projected to increase slightly in the high-cost projection, following the trends in the past—thus, reflecting the assumed gradual increase in the retirement rates. In the low-cost projection, the rates were assumed to remain at about the 1971 level, which reflects the most recent tendency for a leveling-off in this factor.

Wives aged 62 and over of male old-age beneficiaries were estimated by using census data and mortality projections. These potential wife beneficiaries, after adjustment for eligibility to benefits on their own account, were assumed to claim benefits as soon as they are eligible, even if this occurred at ages 62-64, when they would have to take reduced benefits. The experience to date indicates that in the vast majority of the cases, such immediate claiming of wife's benefits does occur.

Young wives and children of retired workers were estimated by reference to their ratios to male old-age beneficiaries, as derived from recent actual data and projected according to the population fertility and mortality assumptions.

Child-survivor beneficiaries were obtained from estimates of total paternal orphans in the country in future years. The projected child population by age groups was multiplied by the probability of being a paternal orphan. These probabilities were derived by using distributions of age of fathers at birth of child and death rates consistent with the population projections. The number of paternal orphans was then adjusted to eliminate orphans of uninsured men, to add orphans of insured women and to include the eligible disabled orphans aged 18 and over. For the non-disabled children aged 18-21, a further reduction was made to exclude those not attending school. Mother survivor beneficiaries were estimated by assuming a constant ratio of mothers to children, after excluding those aged 18-21 who are attending school.

To estimate widow beneficiaries, the proportions of widows in the female aged population were projected according to mortality assumptions and adjusted for both eligibility for benefits on their own account and for the insured status of their deceased husbands. These uninsured eligible widows were assumed to claim benefits as soon as available even if this occurred at ages 60 and 61, when they would have to take reduced benefits. For ages 50-59, the disabled widow beneficiaries were estimated from the eligible widows by using disability prevalence rates.

It can be observed that the assumed wife and widow beneficiaries consist of the uninsured potential beneficiaries. In actual practice, some of the insured potential beneficiaries also receive a residual benefit consisting of the excess of the potential wife's or widow's benefit over their own old-age benefit. These residual benefits, although not giving rise to additional aged beneficiaries, were considered in the cost of the particular type of dependent or survivor benefit concerned.

The minor category of parent beneficiaries was estimated as a constant proportion of aged persons not eligible for any other benefit. The insignificant effect of the retirement test as it applies to wife's, widow's and parent's benefits was ignored. No estimates were made for benefits to dependent husbands and widowers since their cost is relatively negligible.

Appendix table A shows the estimated number of beneficiaries in the old-age and survivors insurance program.

APPENDIX TABLE A.—OLD-AGE AND SURVIVORS INSURANCE BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS<sup>1</sup>  
[In thousands]

Calendar year	Retired workers and dependents			Survivors of deceased workers				Total
	Old-age	Wives <sup>2</sup>	Children	Mothers	Children	Widows <sup>3</sup>	Parents	
Actual data (as of June 30):								
1961.....	8,414	2,330	285	420	1,619	1,622	36	14,726
1962.....	9,348	2,464	378	435	1,690	1,778	37	16,130
1963.....	10,037	2,563	416	457	1,776	1,940	37	17,226
1964.....	10,482	2,595	425	467	1,862	2,087	37	17,955
1965.....	10,843	2,601	429	472	1,900	2,228	36	18,509
1966.....	11,461	2,641	506	480	2,224	2,503	35	19,850
1967.....	11,745	2,619	517	490	2,328	2,686	34	20,419
1968.....	12,188	2,635	522	494	2,447	2,843	32	21,161
1969.....	12,582	2,634	523	497	2,559	3,011	31	21,837
1970.....	13,066	2,651	535	514	2,673	3,151	29	22,619
1971.....	13,604	2,673	556	523	2,745	3,287	28	23,416
Projection (as of June 30):								
1972.....	13,979	2,690	567	520	2,714	3,232	30	23,732
1975.....	15,308	2,746	611	528	2,734	3,354	29	25,310
1980.....	17,680	2,841	660	514	2,675	3,511	28	27,909
1985.....	20,042	2,905	695	524	2,688	3,547	27	30,428
1990.....	22,170	3,009	726	564	2,872	3,498	26	32,865
1995.....	23,606	2,988	726	584	2,992	3,573	25	34,494
2000.....	24,319	2,868	710	588	3,028	3,680	24	35,217
2005.....	25,167	2,735	732	592	3,047	3,879	22	36,174
2010.....	27,303	2,743	828	610	3,124	4,239	21	38,868
2015.....	31,106	2,932	977	640	3,270	4,614	19	43,558
2020.....	35,825	3,321	1,117	674	3,452	5,050	20	49,459
2025.....	40,443	3,669	1,232	706	3,618	5,496	22	55,186
2030.....	43,585	3,875	1,274	736	3,771	5,762	24	59,027
2035.....	45,142	3,862	1,274	768	3,938	6,259	26	61,269
2040.....	46,926	3,926	1,346	806	4,125	6,644	28	63,801
2045.....	49,354	4,124	1,444	846	4,327	6,939	30	67,064

<sup>1</sup> Excluding the effect of the railroad financial interchange provisions.

<sup>2</sup> Including dependent husband beneficiaries.

<sup>3</sup> Including dependent widower beneficiaries.

## (5) LUMP-SUM DEATH PAYMENTS

The numbers of lump-sum death payments were estimated by multiplying the insured population by the death rates used in the population projections.

## (6) DISABILITY INSURANCE BENEFICIARIES

The future number of persons receiving monthly disability benefits based on their own earnings was estimated by the application of incidence and termination rates. These rates were developed from the most recent experience data available from the operations of the disability insurance system. The population insured for disability (by sex, age, and cost assumption) was multiplied by the incidence rates to arrive at the number of new cases of disabled workers. These in turn were projected through the use of mortality and recovery rates to obtain the number of beneficiaries.

The number of child beneficiaries was projected as a proportion of the disabled male beneficiaries allowing for future projected changes in fertility.

The number of wife beneficiaries was projected as a proportion of child beneficiaries after allowing for projected future changes in fertility.

Appendix table B shows the estimated number of beneficiaries in the disability insurance program.

## (7) DEMOGRAPHIC INDEX

The cost of the old-age, survivors, and disability insurance system is directly affected by changes in demographic elements. If the benefit level should, in the future, increase at the same rate as the earnings level, the annual cost of the system as percent of taxable payroll would essentially follow the trends in the demographic changes.

One way to obtain an idea of the overall projected demographic trends would be to compute an OASDI demographic index. Such an index should take into account the movement in the projected number of workers covered by the system, as well as in the number of beneficiaries. However, since under the law each category of beneficiary receives a different benefit amount, and the various categories could follow different trends, it would be necessary in the index to adjust the projected number of beneficiaries to take into account their different benefit amounts.

APPENDIX TABLE B.—DISABILITY INSURANCE BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS<sup>1</sup>

[In thousands]

Calendar year	Workers	Wives <sup>2</sup>	Children	Total
<b>Actual data (as of June 30):</b>				
1961.....	558	103	237	898
1962.....	679	133	340	1,152
1963.....	790	160	432	1,382
1964.....	862	175	480	1,517
1965.....	944	187	518	1,649
1966.....	1,050	209	627	1,886
1967.....	1,141	226	692	2,059
1968.....	1,245	244	768	2,257
1969.....	1,343	254	810	2,407
1970.....	1,436	271	861	2,568
1971.....	1,561	293	934	2,788
<b>Projection (as of June 30):</b>				
1972.....	1,623	299	919	2,841
1975.....	1,814	320	1,033	3,167
1980.....	2,060	353	1,103	3,516
1985.....	2,264	382	1,157	3,803
1990.....	2,399	402	1,200	4,001
1995.....	2,597	427	1,256	4,280
2000.....	2,919	483	1,400	4,832
2005.....	3,418	555	1,587	5,560
2010.....	3,851	622	1,753	6,226
2015.....	4,120	663	1,867	6,650
2020.....	4,284	688	1,938	6,910
2025.....	4,337	697	1,963	6,997
2030.....	4,454	716	2,017	7,187
2035.....	4,808	773	2,177	7,758
2040.....	5,077	816	2,299	8,192
2045.....	5,267	847	2,386	8,500

<sup>1</sup> Excluding the effect of the railroad financial interchange provisions.

<sup>2</sup> Including dependent husband beneficiaries.

A possible demographic index for OASDI is shown in Appendix table C. This index is defined as the adjusted number of beneficiaries per hundred covered workers in the year. For mathematical simplicity, the number of beneficiaries with benefits in current payment status as of June 30 of each year are assumed to be representative of the experience in the whole year. The numbers of beneficiaries in each category are adjusted according to the average benefit in current payment status on June 30, 1971. In fact, all numbers of beneficiaries are recalculated on the basis of their equivalent number of retired worker beneficiaries. As an example, the 514,000 mother beneficiaries in both 1970 and 1980 are recalculated to be equivalent to  $371,675 = 514,000 \times \$94.90 \div \$131.24$  retired worker beneficiaries; based on average monthly benefits of \$94.90 for mothers and \$131.24 for retired workers.

Appendix table C indicates that according to this demographic index, the cost of the OASDI system should have increased by 31 percent (from an index of 18.27 to 23.96) relatively during the 10-year period 1961-71. This observation is based on an assumption that the level of benefits has been updated to exactly reflect increases in average taxable earnings. Since according to table 15 the OASDI cost as percent of taxable payroll increased during the period from 6.60 to 9.06 or 37 percent relatively, it can be concluded that in the last 10 years OASDI average benefits have slightly outpaced increases in average taxable earnings.

APPENDIX TABLE C.—OLD-AGE, SURVIVORS AND DISABILITY INSURANCE DEMOGRAPHIC INDEX<sup>1</sup>

(Numbers in thousands)

Calendar year	Number of covered workers	Adjusted number of beneficiaries <sup>2</sup>			Adjusted number of beneficiaries per hundred covered workers		
		OASI	DI	Total	OASI	DI	Total
<b>Past experience:</b>							
1961.....	72,819	12,574	730	13,304	17.27	1.00	18.27
1962.....	72,285	13,808	907	14,715	18.59	1.22	19.81
1963.....	75,537	14,777	1,069	15,846	19.56	1.42	20.98
1964.....	77,432	15,435	1,169	16,604	19.93	1.51	21.44
1965.....	80,681	15,951	1,275	17,226	19.77	1.58	21.35
1966.....	84,602	17,083	1,436	18,519	20.19	1.70	21.89
1967.....	87,035	17,595	1,563	19,158	20.22	1.80	22.01
1968.....	89,377	18,266	1,709	19,975	20.44	1.91	22.35
1969.....	<sup>3</sup> 92,800	18,883	1,834	20,717	20.35	1.98	22.32
1970.....	<sup>3</sup> 93,600	19,590	1,960	21,550	20.93	2.09	23.02
1971.....	<sup>3</sup> 93,700	20,319	2,129	22,448	21.68	2.27	23.96
<b>Projected experience:</b>							
1972.....	97,524	20,628	2,195	22,823	21.15	2.25	23.40
1975.....	103,616	22,136	2,450	24,586	21.36	2.36	23.72
1980.....	113,083	24,659	2,757	27,416	21.81	2.44	24.25
1985.....	120,219	27,114	3,010	30,124	22.55	2.50	25.06
1990.....	127,813	29,420	3,180	32,600	23.02	2.49	25.51
1995.....	137,570	31,006	3,426	34,432	22.54	2.49	25.03
2000.....	148,628	31,770	3,881	35,651	21.38	2.61	23.99
2005.....	159,154	32,742	4,486	37,228	20.57	2.82	23.39
2010.....	168,276	35,293	5,042	40,335	20.97	3.00	23.97
2015.....	176,425	39,693	5,390	45,083	22.50	3.06	25.55
2020.....	184,519	45,192	5,603	50,795	24.49	3.04	27.53
2025.....	193,099	50,556	5,673	56,229	26.18	2.94	29.12
2030.....	202,309	54,178	5,826	60,004	26.78	2.88	29.66
2035.....	212,091	56,295	6,289	62,584	26.54	2.97	29.51
2040.....	221,841	58,628	6,641	65,269	26.43	2.99	29.42
2045.....	231,567	61,619	6,890	68,509	26.61	2.98	29.58

<sup>1</sup> The OASDI demographic index is defined as the adjusted number of monthly beneficiaries per hundred covered workers.

<sup>2</sup> The number of beneficiaries as of June 30 of each year are adjusted to take into account the average amount for each type of monthly benefit as compared with the average amount for retired worker benefit as of a specified date, which for this table was taken as June 30, 1971. On that date the average benefits were as follows: Retired workers, \$131.24; wives of retired workers, \$68.07; children of retired workers, \$49.51; widowed mothers, \$94.90; survivor children, \$90.61; aged widows, \$112.65; parents, \$113.89; disabled workers, \$145.32; wives of disabled workers, \$46.10; children of disabled workers, \$41.84.

<sup>3</sup> Preliminary estimates.

Looking into the future, the demographic index shows that the cost of the OASDI as percent of taxable payroll is not projected to increase substantially over the next four decades if the benefit level is kept up-to-date with increases in average earnings. The projection shows that the cost will increase slowly to a high value in 1990 which is about 6 percent higher than the cost in 1971. It will then decrease to a low value in 2005, which is about the same cost as in 1971. Thereafter, the cost will increase rapidly and would stabilize after 2025 at about 20-25 percent higher than the cost in 1971.

The above type of analysis of future cost could be affected by principally four different types of Congressional actions:

- (1) New categories of beneficiaries could be added which would add to future costs;
- (2) The program coverage could be extended to employments not now covered. This would have only a negligible effect since very few employments are not now covered;
- (3) The taxable earnings base could be increased faster (or slower) than average earnings, which would make the system cheaper as a percent of taxable payroll (or more expensive); and
- (4) The benefits level could be increased faster (or slower) than average earnings, which would make the system more expensive (or cheaper).

It can be concluded that any cost projection based on the benefit categories and employment coverage in present law and on the assumption that the earnings base will be kept up with increases in average earnings, should follow the cost trend shown by the demographic index, unless the level of benefits does not follow the increases in average earnings. In particular, it will be observed that the cost projection for OASDI in table 18 follows a different pattern. In this case the decreases in cost projected for the next 35-40 years are due to an assumption that the benefit level will not keep up with increases in earnings.

## B. ECONOMIC ASPECTS

In this section of the Appendix, a detailed discussion of the economic aspects of the OASDI long-range cost estimate is presented. The term "economic aspects" is used here to refer to the effect on the cost estimates of changes in the assumptions regarding future increases in average earnings in covered employment as well as future increases in the Consumer Price Index. No attempt has been made to coordinate the various assumptions regarding earnings and CPI with the unemployment assumption. The latter assumption has been allowed to remain at 4.2 percent for all combinations of earnings and CPI presented since the main interest regarding the dynamic projections is on getting an idea of the sensitivity of the cost estimates to earnings and price assumptions.

### (1) LEVEL-EARNINGS ASSUMPTION

Customarily the long-range cost estimates for the old-age, survivors, and disability insurance system have been prepared on the assumption that the average earnings of covered workers would not change in the future. This has not been done in contradiction of the well-known fact that average earnings have increased and should be assumed to increase in the future. Instead it has been indicated and it is well known by those who use the estimates, that as earnings increase in the future (as should be expected) actuarial surpluses are generated which can be used to increase benefits. This means that the level-earnings cost estimates lead in fact to a dynamic system since any financing based on them provides for the financing of some future increases in benefits.

The magnitude of these implicit future benefit increases has not been fully investigated before, but as it will be seen from paragraph (f) and appendix table D in this subsection, they would produce average benefits for OASDI that would increase faster than average earnings, even though the benefit table would increase slower than earnings.

For the purpose of this report all level-earnings cost estimates are based on the assumption that the earnings level that prevailed in calendar year 1971 will continue unchanged in the future.

(a) *Average Benefits.*—The average awarded benefits for retired workers were projected by sex by interpolating between the amounts currently being awarded and an ultimate amount computed as though the 1971 earnings level were in effect through the entire working life of the retiring worker. The average benefits to be paid were later obtained by cohort projections of the estimated awarded benefits.

The average benefits to be paid to dependents and survivors were projected as ratios of the average worker primary insurance amounts taking into account the effect of the family maximum limitation.

(b) *Total Benefit Payments.*—The cost of total benefit payments were calculated as the product of the number of beneficiaries by their corresponding average benefits. These values were later adjusted to reflect the effect of retroactive payments made in the case of new beneficiaries.

(c) *Administrative Expenses.*—The assumed administrative expenses for old-age, survivors, and disability insurance were based on two factors—the number of persons having covered employment in the year and the number of beneficiaries.

(d) *Railroad Retirement Financial Interchange.*—A financial interchange between the old-age, survivors, and disability insurance system and the railroad retirement system arose through amendments made to the Railroad Retirement Act beginning in 1951. The purpose of this interchange is to place the old-age, survivors, and disability insurance system in the same position it would have been in if railroad employment were, and always had been, covered employment under OASDI.

Because of the relatively older age distribution of railroad workers, the transfer of money is currently in favor of the railroad retirement system. But it is estimated that eventually the higher average earnings of railroad employees and increasing proportion of wives and widows of railroad employees receiving benefits directly from the old-age, survivors, and disability insurance system based on their own record rather than on their husband's record will shift the transfer the other way. The long-range cost effect is relatively small, but it is estimated that there will be a "net gain" to the railroad retirement system.

(e) *Interest Rate.*—The 1960 Amendments revised the basis for determining the interest rate on public-debt obligations issued for purchase by the trust funds (special issues), which constitute a major portion of the investment of the trust funds. Under previous law, the interest rate on special obligations was related to the average coupon rate on all outstanding marketable obligations of the United States not due or callable for at least 5 years from the original issue date. Under present law, this interest rate is based on the average market yield of all such marketable obligations not due or callable for 4 or more years from the time of the issuance of the special obligations.

This change has gradually increased the interest income of the trust funds as compared with the previous basis. The ultimate effect is expected to be only a slight increase in the interest income of the system since, over the long run, coupon rates on new long-term Government obligations tend to follow (both up and down) the average market yield on all outstanding long-term issues.

For the long-range cost estimate, a level interest rate of 5.25 percent was assumed. This is close to the average yield of the total investments of the old-age, survivors, and disability insurance trust funds, combined, as of December 31, 1971 (5.35 percent).

The rate applicable for new investments for both trust funds for March 1972 was  $5\frac{3}{4}$  percent.

(f) *Implicit Increases in Average Benefit.*—As was discussed earlier, the level-earnings cost estimates provide for the financing of implicit increases in average benefit.

There are three basic reasons why future average OASDI benefits could increase in the future:

- (1) All or some of the benefits are increased by legislative action;
- (2) The net effect of replacement of older beneficiaries whose benefits are terminated by younger beneficiaries with higher benefits. This could be regarded as "normal" growth in the average benefit due to higher creditable earnings; and
- (3) The composition of the beneficiary group could change towards a larger proportion in those categories of beneficiaries which have higher benefits.

Of these three types of increases, we believe that the last type is more a demographic increase than a real increase in benefits. In this sense, we have regarded this type of an increase as being part of the demographic aspects rather than part of the economic aspects. Its effect has been included in the demographic index presented in appendix table C. In fact, the adjustment made there in the number of beneficiaries was done precisely to take into account this effect.

Of the other two types of increases, the first one is a clear increase in benefits which evidently is not a part of the demographic aspects and could be considered to be part of the economic aspects. The second type is less noticeable and could be easily, but incorrectly, disregarded. This type of increase in benefits is more a part of the economic aspects than of the demographic aspects, since it stems from the way in which benefits are computed in the system and from the past earnings history of the beneficiaries rather than from changes in the number of beneficiaries.

It should be noted that of the two types of increases dealing with economic aspects, the first type is not included in the level-cost estimates since these estimates are based on an unchanging law. On the other hand, the second type of increase is included in the level-earnings cost estimates to the extent that progressively fewer of the benefits payable in the future will be based on earnings credited before 1971 or on the beneficiaries' work history before 1971. Appendix table D provides an indication of the magnitude of this type of increase. According to the last column in the table, the level-earnings cost estimates are based on implied increases in average benefits as compared to increases in average earnings that vary with time. On the basis of the results in this table it can be concluded that the level-earnings cost estimates include an implied assumption that average benefits (but not the benefit table) will increase faster than average earnings. The differential is small at the beginning, but it increases to a level of about 20 percent by the turn of the century. Any financing schedule based on the level-earnings assumption would support increases in average benefits that go beyond increases in earnings by as much as 20 percent by the end of the century.

APPENDIX TABLE D.—COMPARISON OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE "CURRENT COST" PROJECTION UNDER LEVEL-EARNINGS ASSUMPTION AND DEMOGRAPHIC INDEX PROJECTION

Calendar year	"Current cost" under level-earnings estimate		"Demographic index"		"Current cost" projection as compared to demographic projection <sup>1</sup>
	In the year	Ratio to cost in 1972	In the year	Ratio to index in 1972	
1972.....	8.49	1.000	23.40	1.000	1.00
1975.....	8.73	1.028	23.72	1.014	1.01
1980.....	9.36	1.102	24.25	1.036	1.06
1985.....	10.02	1.180	25.06	1.071	1.10
1990.....	10.48	1.234	25.51	1.090	1.13
1995.....	10.53	1.240	25.03	1.070	1.16
2000.....	10.32	1.216	23.99	1.025	1.19
2005.....	10.24	1.206	23.39	1.000	1.21
2010.....	10.60	1.249	23.97	1.024	1.22
2015.....	11.31	1.332	25.55	1.092	1.22
2020.....	12.14	1.430	27.53	1.176	1.22
2025.....	12.74	1.501	29.12	1.244	1.21
2030.....	12.91	1.521	29.66	1.268	1.20
2035.....	12.86	1.515	29.51	1.261	1.20
2040.....	12.82	1.510	29.42	1.257	1.20
2045.....	12.88	1.517	29.58	1.264	1.20

<sup>1</sup> Computed as the ratio of the "current cost" ratio in the 2nd column to the "demographic index" ratio in the 4th column. The values in this column provide an approximate measure of the excess increases in average benefits as compared with increases in average earnings that is assumed in the cost estimates.

## (2) DYNAMIC ASSUMPTIONS

The latest Advisory Council on Social Security recommended that the long-range cost estimates for the old-age, survivors, and disability insurance system be prepared on the basis of dynamic assumption. In particular, the Council recommended that the taxable earning base be assumed to automatically be increased to keep up with increases in average earnings and benefits be increased to keep up with the Consumer Price Index. In the latter case, we believe that what the Council recommended was that the benefit table be automatically adjusted to reflect increase in CPI, since this is the type of mechanism to adjust benefits that have been incorporated in recent social security bills introduced in the Congress as well as the procedure used in the past by the Congress to modify the general level of benefits.

This type of automatic procedure has the effect that once a worker retires his benefits will not deteriorate in terms of purchasing power. It has the further effect that a worker before retirement will have his potential benefits increased because of his increase in credited earnings, and in addition, adjusted to maintain purchasing power. This dual increase in potential benefits for future beneficiaries may in combination be above or below increases in earnings; but (as will be shown later) is likely to be below this level on the average for the next 20 years and somewhat higher thereafter. On the average, when all OASDI beneficiaries are taken together, their average benefits will increase faster than the CPI but not as fast as earnings.

The approximate effect of the automatic procedure on the average benefit for all OASDI beneficiaries is illustrated in table E. Under the specific economic

assumption indicated, the average benefits generated by the automatics decline for about three decades in relation to average earnings, reaching a relative loss of 18 percent by the end of the century.

The Advisory Council methodology provides only enough financing for automatic increases in benefits to reflect changes in the CPI. These automatic benefit increases alone are not likely to be enough to prevent a deterioration in the benefits/earnings ratio. Congress has the option of preventing such deterioration by enacting benefit increases beyond these automatics, but additional financing would be needed. It follows that the basic assumption behind the Advisory Council methodology is that Congress, when in the future it enacts benefit increases beyond those which arise from the automatic provisions contemplated, will also simultaneously provide the necessary additional financing.

APPENDIX TABLE E.—COMPARISON OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE "CURRENT COST" PROJECTION UNDER INCREASING-EARNINGS ASSUMPTION AND DEMOGRAPHIC INDEX PROJECTION

Calendar year	"Current cost" under increasing earnings estimate <sup>1</sup>		"Demographic index"		"Current cost" projection as compared to demographic projection <sup>2</sup>
	In the year	Ratio to cost in 1972	In the year	Ratio to index in 1972	
1972.....	8.52	1.000	23.40	1.000	1.00
1975.....	8.30	.974	23.72	1.014	.96
1980.....	8.04	.944	24.25	1.036	.91
1985.....	8.02	.941	25.06	1.071	.88
1990.....	7.88	.925	25.51	1.090	.85
1995.....	7.49	.879	25.03	1.070	.82
2000.....	7.13	.837	23.99	1.025	.82
2005.....	7.05	.828	23.39	1.000	.83
2010.....	7.37	.865	23.97	1.024	.84
2015.....	7.97	.935	25.55	1.092	.86
2020.....	8.63	1.013	27.53	1.176	.86
2025.....	9.12	1.070	29.12	1.244	.86
2030.....	9.29	1.090	29.66	1.268	.86
2035.....	9.33	1.095	29.51	1.261	.87
2040.....	9.39	1.102	29.42	1.257	.88
2045.....	9.53	1.118	29.58	1.264	.88

<sup>1</sup> Based on projected annual increases of 5 percent in earnings and 2¾ percent in Consumer Price Index. Does not include any factor for contingency margin.

<sup>2</sup> Computed as the ratio of the "current cost" ratio in the 2nd column to the "demographic index" ratio in the 4th column. The values in this column provide an approximate measure of the lag in the increases in average benefits (for all type of beneficiaries combined) as compared with increases in average earnings that is assumed in the cost estimate.

(a) *Average Benefits.*—The average awarded benefits for retired workers were projected by computer simulation of the automatic provisions for workers at various earnings levels under the specific assumptions regarding increases in earnings and CPI. The average benefits in current payment status were then obtained by weighting the awarded benefits according to values obtained from recent actual experience after allowing for the effect of projected CPI adjustments.

Appendix table F shows the projected awarded benefits at retirement, the projected average retirement benefits in current payment status and their projected increases as compared to increases in average earnings based on assumed annual increases of 5 percent in earnings and 2¾ percent in the Consumer Price Index. As will be observed from the last two columns in the table, the average awarded retirement benefits as well as the average retirement benefits in current payment status would increase at a rate substantially lower than average earnings, up to around the turn of this century; from then on the reverse is projected to occur. We must emphasize that these projections are based on annual increases in average earnings of 5 percent and in the Consumer Price Index of 2¾ percent and that the extensions of the benefit table are assumed to be on the basis of a 20 percent benefit factor. If these assumptions were modified, the projection would be different in absolute terms. However, the relative trough around the turn of the century would still be there since it is associated with the procedure used for calculating the average monthly wage of retiring workers, rather than with the economic assumption or with the form of the benefit table.

Under the present law, workers attaining age 65 in 1972 have their average monthly wage computed over a period of 16 years for males and 13 years for females. These computation periods are required by law to increase by one year for

each year elapsed until a maximum is reached in the year 1994, and after which they will remain unchanged.

The results in Appendix table F indicate that the dual type of increments to which potential retirement benefits are subject under dynamic assumption would be higher than the increases in average earnings after 1993, but that before that year the present procedure of extending the computation period would offset enough of the dual increments to produce potential retirement benefits that increase at rates lower than earnings.

APPENDIX TABLE F.—PROJECTED INCREASES IN AVERAGE RETIREMENT BENEFIT AT AWARD AND IN CURRENT-PAYMENT STATUS AS COMPARED WITH PROJECTED INCREASES IN AVERAGE COVERED EARNINGS, DYNAMIC ASSUMPTIONS<sup>1</sup>

Calendar Year	Average annual retirement benefit		Ratio of increase in retirement benefits to increase in earnings	
	Awards	In current-payment	Awards	In current-payment
1972	\$1,757	\$1,634	1.000	1.000
1975	2,008	1,828	.987	.966
1980	2,523	2,239	.972	.927
1985	3,182	2,791	.960	.906
1990	3,972	3,502	.939	.891
1995	5,003	4,384	.927	.874
2000	6,462	5,534	.938	.864
2005	8,430	7,085	.959	.867
2010	11,006	9,184	.981	.890
2015	14,237	11,956	.994	.898
2020	18,316	15,500	1.002	.912
2025	23,565	19,999	1.010	.922
2030	30,322	25,745	1.019	.930
2035	39,029	33,130	1.027	.938
2040	50,226	42,637	1.036	.946
2045	64,762	54,888	1.046	.954

<sup>1</sup> Based on annual increases in average earnings of 5 percent and in Consumer Price Index of 2¾ percent and on extensions in the benefit table on the basis of a 20-percent factor.

Note: The last 2 columns in this table are similar to the last column in appendix table E. However, while the values in that table pertain to all beneficiaries and in addition include the effect of the administrative expenses, the railroad interchange, and the needed accumulation of funds to maintain 1 year's benefit on hand, those in this table refer only to benefits payable to retired workers. The columns under the heading "in current-payment" refer to the average benefits for all retired workers who are receiving benefits, while the column under the heading "Awards" refer to the average benefits for those workers retiring in the particular year.

(b) *Total Benefit Payments.*—As in the cases of the level-earnings cost estimates, the total benefit payments were calculated as the product of the number of beneficiaries by their corresponding average benefits. These values were adjusted to reflect retroactive payments.

(c) *Administrative Expenses.*—On the basis of recent experience and expected operations, it was assumed that future administrative expenses would be 1.8 percent of benefit payments for OASI and 5.0 percent of benefit payments for DI.

(d) *Railroad Retirement Financial Interchange.*—The effect of the financial interchange was evaluated on essentially the same methodology used under the level-earnings assumption, which reflects the trends in benefits and earnings developed from the OASDI direct cost. Under the dynamic assumptions the interchange would still produce a net loss to the OASDI system.

(e) *Interest Rate.*—Interest rate was assumed at 5¼ percent per year, as was the case in level-earnings estimate. We realize that interest should be regarded as a variable that is affected by other economic assumptions. However, the relation between interest, CPI and earnings is not well established although we believe that it would be reasonable to assume that there is a differential of 3 to 3½ percent between interest and CPI on a long-range basis.

For all estimates, the 5¼ percent interest assumption was retained principally because the cost projections are almost insensitive to varying interest assumptions due to the fact that the system has been operated and has been recommended to be operated on a "current cost" basis with the accumulation of contingency funds only.

(f) *Sensitivity to Economic Assumptions.*—Up to this point, the cost projections that have been presented under dynamic assumption have been based on annual

increases in earnings of 5 percent and in Consumer Price Index of 2¼ percent. It has been indicated that other sets of economic assumptions would yield different results. In this subparagraph, we present a brief analysis of the sensitivity of the cost projections to changes in the economic assumptions. No claim is made about the internal consistency within each one of these sets of economic assumptions, when viewed in terms of today's national economy or of a possible long-range projection of that economy. The sets were selected around a central set of projected increases in average earnings, CPI, and implied increases in real earnings of 5 percent, 2¼ percent and 2¼ percent, respectively, in order to offer an idea of how each one of these elements affects the cost projections.

All variations in the economic assumptions were taken on the order of one-quarter of one percent. This was not intended to represent the possible outside range of variation in the assumptions. It only represents a convenient uniform way of testing the sensitivity of the cost projections.

Appendix table G presents the results of this sensitivity test. In calculating the values shown, all assumptions, formulae, and procedures used were the same for all sets except for those specific assumptions that are shown to have been varied. In all cases, a three-eighths of one percent contingency margin was added for all years up to the year 2010.

The first column in the table shows the projected "current cost" under the central assumptions. This projection is identical to the one presented in table 18 in the main body of this report. It is included in this table in order to facilitate visual comparisons with other projections in assessing the sensitivity of the projections to the assumptions. Under the central assumptions, the average "current cost" of the OASDI system is estimated at 9.23 percent of taxable payroll.

It should be observed that the overall projected "current cost" is measured in this table in terms of the arithmetic average of "current cost" for each of the 75 years in the valuation period. This is a departure from the level-cost concept used under level-earnings assumptions. The latter concept represents the uniform tax rate that would finance the system over the 75 years. As such, it takes into account interest and the growth of the system in absolute dollars. If the use of such a concept were extended to the dynamic projections, the numerical values of the overall cost would not be significantly different from those obtained under the "average cost" concept since in that case the effect of interest in the calculations would virtually offset the effect of the projected growing dollar cost in the system. On the other hand, we believe that the new average-cost concept has the advantages of being simpler and easier to understand.

APPENDIX TABLE G.—PROJECTED "CURRENT COST"<sup>1</sup> OF OLD-AGE, SURVIVORS, AND DISABILITY INSURANCE SYSTEM AS PERCENT OF PAYROLL,<sup>2</sup> UNDER VARIOUS DYNAMIC ASSUMPTIONS, FOR SELECTED YEARS, 1972-2045

Calendar year	Dynamic economic assumption <sup>3</sup>						
	5.00-2.75	5.00-2.50	5.00-3.00	4.75-2.75	5.25-2.75	4.75-2.50	5.25-3.00
1972	8.52	8.49	8.54	8.52	8.52	8.49	8.54
1975	8.39	8.32	8.47	8.45	8.34	8.37	8.41
1980	8.29	8.12	8.48	8.43	8.14	8.25	8.34
1985	8.42	8.14	8.70	8.64	8.18	8.36	8.46
1990	8.43	8.04	8.81	8.74	8.12	8.35	8.49
1995	8.16	7.71	8.64	8.53	7.79	8.07	8.26
2000	7.92	7.38	8.47	8.33	7.50	7.78	8.04
2005	7.98	7.35	8.63	8.44	7.52	7.78	8.14
2010	8.49	7.76	9.30	9.01	7.95	8.23	8.72
2015	9.19	8.31	10.16	9.80	8.55	8.87	9.44
2020	9.95	8.91	11.08	10.65	9.19	9.56	10.26
2025	10.51	9.34	11.82	11.27	9.66	10.03	10.86
2030	10.71	9.45	12.13	11.55	9.82	10.18	11.10
2035	10.76	9.44	12.28	11.62	9.81	10.17	11.18
2040	10.82	9.44	12.42	11.70	9.83	10.18	11.26
2045	10.98	9.51	12.67	11.89	9.94	10.29	11.44
Average cost <sup>4</sup>	9.23	8.47	10.08	9.76	8.67	8.94	9.45

<sup>1</sup> Represents the cost as percent of payroll of the year's total outgo, including amounts needed to maintain the funds at about 1 year's outgo.

<sup>2</sup> Payroll is adjusted to take into account the lower contribution rate on self-employment income, on tips, and on multiple-employer "excess wages" as compared with the combined employer-employee rate.

<sup>3</sup> The 1st of the 2 figures represents the assumed annual percent increase in earnings after 1972, while the 2d figure represents the assumed increase in CPI. In all cases a ¾ of 1 percent contingency margin is included for years up to 2010.

<sup>4</sup> Represents the arithmetic average of the "current cost" for the 75-year period 1972-2046.

The second and third columns in Appendix table G present the projected "current cost" on the assumptions that increases in earnings would remain at the same 5 percent level as in the central set, but that CPI would be one quarter of one percent lower or higher than in the central set. These results could also be interpreted as being based on a one quarter of one percent variation on the projected gain in real earnings wherein the whole variation is reflected in a change in CPI. These projections indicate that a one quarter of one percent variation in CPI would change the average-cost by about 9 percent relatively.

The fourth and fifth columns present the projected "current cost" on the assumptions that the CPI increase would remain at the  $2\frac{3}{4}$  percent level used in the central set, but that the increases in earnings would be one quarter of one percent lower or higher than in the central set. These results could also be interpreted as being based on a one quarter of one percent variation on the projected gain in real earnings wherein the whole variation is reflected in a change in earnings. These projections indicate that a one quarter of one percent variation in earnings would change the average-cost by about 6 percent relatively.

A significant fact to be noted is that both the second column and the fifth column, as well as both the third and fourth columns are based on the same projected gain in real earnings,  $2\frac{1}{2}$  and 2 percent, respectively, but that the projected average costs are different. This means that even though two projections could be based on the same gain in real earnings, the projected cost of the OASDI system would be affected by the level of CPI increases. We could also interpret the results to mean that everything being equal the cost of the OASDI system will depend on the level of inflation, with the cost being lower if inflation can be controlled.

The same effect can be observed by comparing the first, sixth, and seventh columns. In this case the real earnings gains are assumed at  $2\frac{1}{4}$  percent. As will be noted, the average-cost of the OASDI system increases by 2 to 3 percent relatively for every one quarter of one percent increase in CPI and earnings.

In general this sensitivity analysis indicates that the effect of variations in the economic assumptions is relatively small in the early years, but that it becomes progressively more significant as we move into later years.

(g) *The Central Set of Economic Assumptions.*—The central set of economic assumptions was selected on the basis of the average gain in real earnings of  $2\frac{1}{4}$  percent that has been observed over the last 20 years. To this was added an increase in CPI assumption of  $2\frac{3}{4}$  percent to yield an assumption of a total increase in average earnings of 5 percent. Both the CPI assumption ( $2\frac{3}{4}$  percent) and the average earnings assumption (5 percent) are approximately one-half percent higher than the experience of the last 20 years. These assumptions are presented in this appendix to obtain an idea of possible trends in the future OASDI cost. They are not intended to be a prediction of what should be expected over the next 75 years.

